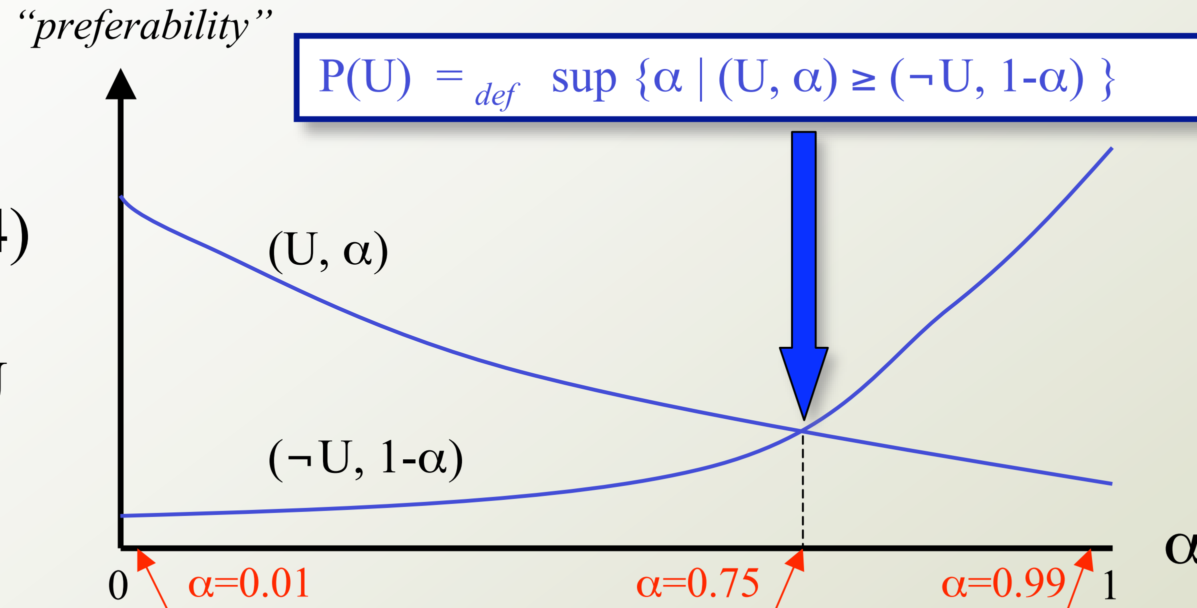
CAVEAT: There is not actually a real-valued "preferability" assigned to bets; these graphs are just meant to hint at relative preference.

$$P(U) =_{def} \sup \{\alpha \mid (U, \alpha) \geq (\neg U, 1-\alpha)\}$$

If a rational agent (satisfying RAT1-4) has the preferences shown here, then U would be assigned probability 0.75.



A bet:

		α=0.01	α=0.75	α=0.99
(U, α)	if U (75%):	win \$99	win \$25	win \$1
	if ¬U (25%):	lose \$1	lose \$75	lose \$99
		prefer!	?	

Its complementary bet:

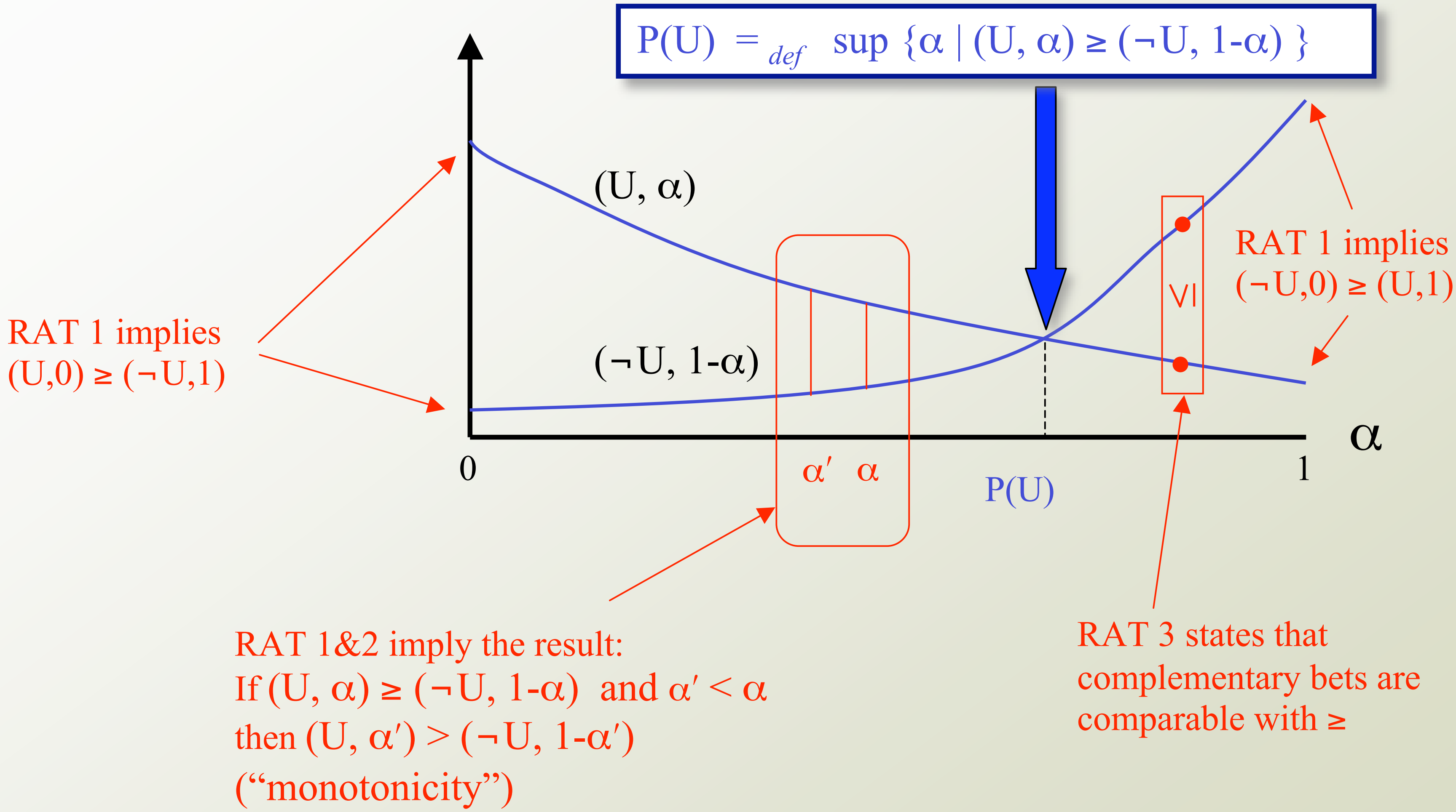
		α=0.01	α=0.75	α=0.99
(¬U, 1-α)	if U (75%):	lose \$99	lose \$25	lose \$1
	if ¬U (25%):	win \$1	win \$75	win \$99
			?	*prefer!*

At α=0.01 clearly (U, α) ≥ (¬U, 1-α)

At α=0.75, no preference

At α=0.99 clearly (¬U, 1-α) ≥ (U, α)

CAVEAT: There is not actually a real-valued "preferability" assigned to bets; these graphs are just meant to hint at relative preference.



How some of the RAT axioms and their mathematical consequences relate to this way of defining probability.